

WHAT IS CLAIMED IS:

1. An object determining device comprising:

a face detecting part for detecting, from an image imaged based on arbitrary focal point information as an image to be processed, a face of a person based on a relative value of statistics in a plurality of characteristic regions produced by contour or parts of a face of a person from the image to be processed; and

a determining part for determining a subject to be focused and/or subject on which to perform exposure control when performing imaging based on the face detected by the face detecting part.

2. An object determining device comprising:

a frame acquiring part for acquiring an image of a predetermined frame as an image to be processed from a time-series image including a plurality of frames imaged based on arbitrary focal point information;

a face detecting part for detecting a face of a person based on a relative value of statistics in a plurality of characteristic regions produced by contour or parts of a face of a person from the image to be processed; and

a determining part for determining a subject to be focused and/or subject on which to perform exposure control when performing imaging based on the face detected by the face detecting part.

3. The object determining device according to claim 1 or 2, wherein the face detecting part derives the relative value of the statistics of a first region and a second region which are characteristic regions within an emphasis region in the image to be processed, and detects a face of a person by deciding whether or not a face of a person is included in the emphasis region based on the relative value of the statistics.

4. The object determining device according to claim 1 or 2, wherein when a plurality of faces are detected by the face detecting part, the determining part determines one face based on image information of each of the plurality of faces, and determines the subject to be focused and/or subject on which to perform exposure control based on the face.

5. The object determining device according to claim 4, wherein the determining part compares a size of an image of each of the plurality of faces, and determines the subject to be focused and/or subject on which to perform exposure control based on the face in which the size is the largest.

6. The object determining device according to claim 4, wherein the determining part calculates points based on at least one of orientation of the face, size of the face, position in the image, or density of the neighboring faces, and uses the calculated points as the image information.

7. The object determining device according to claim 1 or 2, wherein when a plurality of faces are detected by the face detecting part, the determining part determines, according to a result of distance measurement on each of the plurality of real faces, the subject to be focused and/or subject on which to perform exposure control based on the face in which the distance is the smallest.

8. An imaging apparatus comprising:

an imaging section for imaging an image based on a predetermined focal point information or focal point information and/or exposure control information acquired by an information acquiring section;

a face detecting part for detecting a face of a person based on a relative value of statistics in a plurality of characteristic regions produced by contour or parts of a face of a person from an image imaged by the imaging section based on the predetermined focal point information and/or exposure control information acquired by an information acquiring section;

a determining part for determining a subject to be focused and/or subject on which to perform exposure control when performing imaging based on the face detected by the face detecting part;

an information acquiring section for acquiring focal point information for focusing on a subject determined by the determining part and/or exposure control information for performing exposure control on a subject determined by the determining part; and

an image storing section for storing an image imaged by the imaging section based on the focal point information and/or exposure control information acquired by the information acquiring section.

9. An imaging apparatus comprising:

an imaging section for imaging a time-series image including a plurality of frames based on a predetermined focal point information or focal point information and/or exposure control information acquired by an information acquiring section;

a frame acquiring section for acquiring an image of a predetermined frame from the time-series image including a plurality of frames imaged by the imaging section;

a face detecting part for detecting a face of a person based on a relative value of statistics in a plurality of characteristic regions produced by contour or parts of a face of a person from the image acquired by the frame acquiring section;

a determining part for determining a subject to be focused and/or subject on which to perform exposure control when performing imaging based on the face detected by the face detecting part;

an information acquiring section for acquiring focal point information for focusing on a subject determined by the determining part and/or exposure control information for performing exposure control on a subject determined by the determining part; and

an image storing section for storing the time-series image imaged by the imaging section based on the focal point information and/or exposure control information acquired by the information acquiring section.

10. The imaging apparatus according to claim 8 or 9, further comprising a distance measuring section for distance measuring a distance from the imaging apparatus to an arbitrary subject; wherein

when a plurality of faces of people are detected by the face detecting part, the determining part determines, according to a result of distance measurement by the distance measuring section on each of the plurality of real faces, the subject to be focused and/or subject on which to perform exposure control based on the face in which the distance is the smallest.

11. The imaging apparatus according to claim 8 or 9, further comprising a displaying section for displaying the face of a person determined by the determining part distinctly from other faces.

12. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

detecting, with an image imaged based on arbitrary focal point information as an image to be processed, a face of a person based on a relative value of statistics in a plurality of characteristic regions produced by contour or parts of a face of a person from the image to be processed; and

determining a subject to be focused and/or subject on which to perform exposure control when performing imaging based on the detected face.

13. An object determining device comprising:

a detecting part for detecting a face of a person from an input image; and

a determining part for determining, when a plurality of faces of people are detected by the detecting part, a face to be focused and/or subject on which to perform exposure control when performing imaging from the plurality of faces of people based on positions of the plurality of faces of people.

14. An object determining device comprising:

a frame acquiring section for acquiring an image of a predetermined frame as an image to be processed from an input time-series image including a plurality of frames;

a detecting part for detecting a face of a person from the image to be processed; and

a determining part for determining, when a plurality of faces of people are detected by the detecting part, a face to be focused and/or subject on which to perform exposure control when performing imaging from the plurality of faces of people based on positions of the plurality of faces of people.

15. The object determining device according to claim 13 or 14, further comprising:

a center determining portion for determining a center of the positions of the plurality of faces of people based on the positions of the plurality of faces of people; and

a face determining portion for determining a target face based on the position of the center.

16. The object determining device according to claim 15, wherein the center determining portion determines a center of a polygon circumscribing the positions of the plurality of faces of people as the center.

17. The object determining device according to claim 15, wherein the center determining portion determines a barycenter of the positions of the plurality of faces of people as the center.

18. The object determining device according to claim 15, wherein the face determining portion determines the face of a person positioned closest to the center as the target face.

19. The object determining device according to claim 15, wherein the face determining portion determines the target face according to a predetermined reference from faces positioned within a predetermined distance from the center.

20. The object determining device according to claim 13 or 14, wherein the determining part determines a face positioned the lowest of the plurality of faces of people as the target face.

21. An object determining device comprising:

a detecting part for detecting a face of a person from an input image; and  
a determining part for determining, when a plurality of faces of people are detected by the detecting section, a face of a person positioned in the middle, with the number of detected faces as a reference, as a face to be focused and/or subject on which to perform exposure exposure control when performing imaging.

22. An object determining device comprising:

a frame acquiring section for acquiring an image of a predetermined frame as an image to be processed from an input time-series image including a plurality of frames;

a detecting part for detecting a face of a person from the image to be processed; and

a determining part for determining, when a plurality of faces of people are detected by the detecting part, a face of a person positioned in the middle, with the number of detected faces as a reference, as the face to be focused and/or face on which to perform exposure control when performing imaging.

23. The object determining device according to claim 13, 14, 21 or 22, further comprising:

a classifying part for classifying, when a plurality of faces of people are detected by the detecting part, the plurality of detected faces of people into a plurality of clusters based on respective positions; and

a cluster determining part for determining a selected cluster to determine the target face from the plurality of clusters; wherein

the determining part determines the target face based on a face of a person included in the selected cluster.

24. The object determining device according to claim 13, 14, 21 or 22, further comprising a displaying section for displaying the face of a person determined by the determining part distinctly from other faces.

25. An object determining device comprising:

a detecting part for detecting a face of a person from an input image;



a classifying part for classifying, when a plurality of faces of people are detected by the detecting part, the plurality of detected faces of people into a plurality of clusters;

a temporary determining part for determining a face to be focused and/or face on which to perform exposure control when performing imaging from faces of people in the cluster for each of the plurality of clusters; and

an ultimate determining part for ultimately determining the target face from the faces determined by the temporary determining part.

26. An object determining device comprising:

a frame acquiring section for acquiring an image of a predetermined frame as an image to be processed from an input time-series image including a plurality of frames;

a detecting part for detecting a face of a person from the image to be processed;

a classifying part for classifying, when a plurality of faces of people are detected by the detecting part, the plurality of detected faces of people into a plurality of clusters;

a temporary determining part for determining a face to be focused and/or face on which to perform exposure control when performing imaging from faces of people included in the cluster for each of the plurality of clusters; and

an ultimate determining part for ultimately determining the target face from faces determined by the temporary determining part.

27. An object determining device comprising:

a detecting part for detecting a face of a person for each of a plurality of blocks divided from an input image;

a block determining part for determining a selected block for determining a face to be focused and/or face on which to perform exposure control when performing imaging based on a detection result of the detecting part; and

a determining part for determining the target face from the faces in the selected block.

28. An object determining device comprising:

a frame acquiring section for acquiring an image of a predetermined frame as an image to be processed from an input time-series image including a plurality of frames;

a detecting part for detecting a face of a person for each of a plurality of blocks divided from the image to be processed;

a block determining part for determining a selected block for determining a face to be focused and/or face on which to perform exposure control when performing imaging based on a detection result of the detecting part; and

a determining part for determining the target face from faces included in the selected block.

29. An object determining device comprising:

a detecting part for detecting a face of a person from an input image;

a deciding part for deciding, when a plurality of faces of people are detected by the detecting part, a largest face from the detected faces of people;

a selecting part for selecting the largest face and a face having a size within a predetermined range with the size of the largest face as a reference from the detected faces; and

a determining part for determining a face to be focused and/or face on which to perform exposure control when performing imaging from the selected faces.

30. An object determining device comprising:

a frame acquiring section for acquiring an image of a predetermined frame as an image to be processed from an input time-series image including a plurality of frames;

a detecting part for detecting a face of a person from the image to be processed;

a deciding part for deciding, when a plurality of faces of people are detected by the detecting part, a largest face from the detected faces of people;

a selecting part for selecting the largest face and a face having a size within a predetermined range with the size of the largest face as a reference from the detected faces; and

a determining part for determining a face to be focused and/or face on which to perform exposure control when performing imaging from the selected faces.

31. An object determining device comprising:

a detecting part for detecting a face of a person from an input image;

a classifying part for classifying, when a plurality of faces of people are detected by the detecting part, the plurality of detected faces of people into a plurality of clusters based on respective positions; and

a cluster determining part for determining a selected cluster to determine a face to be focused and/or face on which to perform exposure control when performing imaging from the plurality of clusters; and

a determining part for determining the target face from faces included in the selected cluster determined by the cluster determining part.

32. An object determining device comprising:

a frame acquiring section for acquiring an image of a predetermined frame as an image to be processed from an input time-series image including a plurality of frames;

a detecting part for detecting a face of a person from the image to be processed;

a classifying part for classifying, when a plurality of faces of people are detected by the detecting part, the plurality of detected faces of people into a plurality of clusters based on the respective positions;

a cluster determining part for determining a selected cluster to determine a face to be focused and/or face on which to perform exposure control when performing imaging from the plurality of clusters; and

a determining part for determining the target face from faces included in the selected cluster determined by the cluster determining part.

33. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

detecting a face of a person from an input image; and

determining, when a plurality of faces of people are detected, a face to be focused and/or face on which to perform exposure control when performing imaging from a plurality of faces of people based on positions of the plurality of faces of people.

34. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

detecting a face of a person from an input image; and

determining, when a plurality of faces of people are detected, a face of a person positioned in the middle, with the number of detected faces as a reference, as a face to be focused and/or face on which to perform exposure control when performing imaging.

35. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

detecting a face of a person from an input image;

classifying, when a plurality of faces of people are detected, the plurality of detected faces of people into a plurality of clusters based on the respective positions;

determining a face to be focused and/or face on which to perform exposure control when performing imaging from faces included in the cluster for each of the plurality of clusters; and

ultimately determining the target face from faces detected in each of the cluster.

36. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

- detecting a face of a person in each of a plurality of blocks divided from an input image;

- determining a selected block to determine a face to be focused and/or face on which to perform exposure control when performing imaging based on detection result in each of the block; and

- determining the target face from faces included in the selected block.

37. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

- detecting a face of a person from an input image;

- deciding, when a plurality of faces of people are detected, a largest face out of the plurality of detected faces of people;

- selecting the largest face and at least one other face having a size within a predetermined range with the size of the largest face as a reference from the detected faces; and

- determining the face to be focused and/or face on which to perform exposure control when performing imaging from the selected faces.

38. A computer readable medium containing a program for an information processing device, said program when executed by the processing device causes the processing device to perform a method comprising the steps of:

detecting a face of a person from an input image;

classifying, when a plurality of faces of people are detected, the plurality of detected faces of people into a plurality of clusters based on the respective positions;

determining a selected cluster for determining a face to be focused and/or face on which to perform exposure control when performing imaging from the plurality of clusters; and

determining the target face from faces included in the determined selected cluster.

39. The object determining device according to claim 1 or 2, wherein when a plurality of faces of people are detected by the face detecting part, the determining part determines the face to be focused and/or face on which to perform exposure control when performing imaging from the plurality of faces of people based on positions of the plurality of faces of people.

40. The object determining device according to claim 1 or 2, wherein when a plurality of faces of people are detected by the face detecting part, the determining part determines a face of a person positioned in the middle, with the number of detected faces as a reference, as the face to be focused and/or face on which to perform exposure control when performing imaging.

41. The object determining device according to claim 1 or 2, wherein the determining part includes,

a classifying part for classifying, when a plurality of faces of people are detected by the face detecting part, a plurality of detected faces of people into a plurality of clusters;

a temporary determining part for determining a face to be focused and/or face on which to perform exposure control when performing imaging from faces of people included in the cluster for each of the plurality of clusters; and

an ultimate determining part for ultimately determining the target face from faces determined by the temporary determining part.

42. The object determining device according to claim 1 or 2, further comprising a block determining part for determining a selected block for determining a face to be focused and/or face on which to perform exposure control when performing imaging based on a detection result of the face detecting part; wherein

the determining part determines the target face from faces included in the selected block.

43. The object determining device according to claim 1 or 2, further comprising:

a deciding part for deciding, when a plurality of faces of the people are detected by the face detecting part, a largest face out of the detected faces of people; and

a selecting part for selecting the largest face and a face having a size within a predetermined range with the size of the largest face as a reference from the detected faces; wherein



the determining part detects a face to be focused and/or face on which to perform exposure control when performing imaging from the selected faces.

44. The object determining device according to claim 1 or 2, further comprising:

a classifying part for classifying, when a plurality of faces of people are detected by the face detecting part, the plurality of detected faces of people into a plurality of clusters based on the respective positions; and

a cluster determining part for determining a selected cluster for determining a face to be focused and/or face on which to perform exposure control when performing imaging from the plurality of clusters; wherein

the determining part determines the target face from faces included in the selected cluster determined by the cluster determining part.